EMERGENCY ACTION PLAN

CARBONE FLOOD CONTROL DAM

Spring Creek Coal LLC
Spring Creek Mine
Lakeshore Drive
P.O. Box 67
Decker, Montana 59025

Updated April 7, 2011

If Carbone Dam is failing or failure seems imminent, call:

Big Horn County Sheriff ..... (406) 665-9780 or 911

TABLE OF CONTENTS

APPENDICES

I. INTRODUCTION

A. Purpose

The purpose of this emergency action plan (EAP) is primarily to safeguard lives and secondarily to reduce property damage to the employees of the Spring Creek Mine as well as citizens who may be in the area downstream of the dam on Spring Creek, in the event of flooding caused by a failure of Carbone Dam.

B. Description of Dam

Carbone Dam is in Big Horn County, in Section 15, Township 8 South (T8S), Range 39 East (R39E), and located on Spring Creek, a tributary of Tongue River. It is owned by the Spring Creek Coal LLC, P.O. Box 67, Decker, Montana 59025, and is used for flood control. Technical data pertaining to the Carbone Dam and its structures are shown in Appendix A.

C. Access to Dam

Carbone Dam is located within property owned by the Spring Creek Coal LLC, about ten miles west of the Tongue River Dam in Big Horn County, Montana. To gain access to the mine's property, the company can be contacted at (406) 757-2581.

D. Hazard Area

The evacuation area extends along Spring Creek until it goes under State Highway 314, as shown in Appendix B. Hazards include the possible inundation of mining operations (both Spring Creek Coal LLC and Decker Coal Company), State Highway 314 (and parallel railroad tracks) and Tongue River Reservoir State Park. Inundation and evacuation maps are in Appendix B.

E. Responsibility and Authority

Pursuant of the Dam Safety Act, Chapter 15 of Title 85, MCA, the dam owner is responsible for production, coordination, maintenance, and implementation of this emergency action plan. The extent of owner implementation was defined through coordination of this plan with the County Sheriff and Disaster and Emergency Services (DES) coordinator.

F. Periodic Review/Update

The owner shall review/update this EAP annually. Review/update by a qualified professional engineer will be accomplished by the dam's operating permit, but no less that every five years.

G. Approval

By my signature, I acknowledge that I, or my representative, have reviewed this plan and agree to the tasks and responsibilities assigned herein for my department and/or agency.

Eric M. [illegible] Signature 2/9/09 Date
AUTHORIZED REPRESENTATIVE, SPRING CREEK COAL COMPANY

Lawrence C. B. Hair Sr. Signature 2-24-09 Date
BIG HORN COUNTY SHERIFF'S DEPARTMENT

[illegible] Signature 2/5/9 Date
STATE OF MONTANA, Big Horn County
DISASTER AND EMERGENCY SERVICES

II. NOTIFICATION PROCEDURES

A. Imminent or Actual Failure

IF CARBONE IS FAILING, TWO THINGS MUST BE DONE IMMEDIATELY:

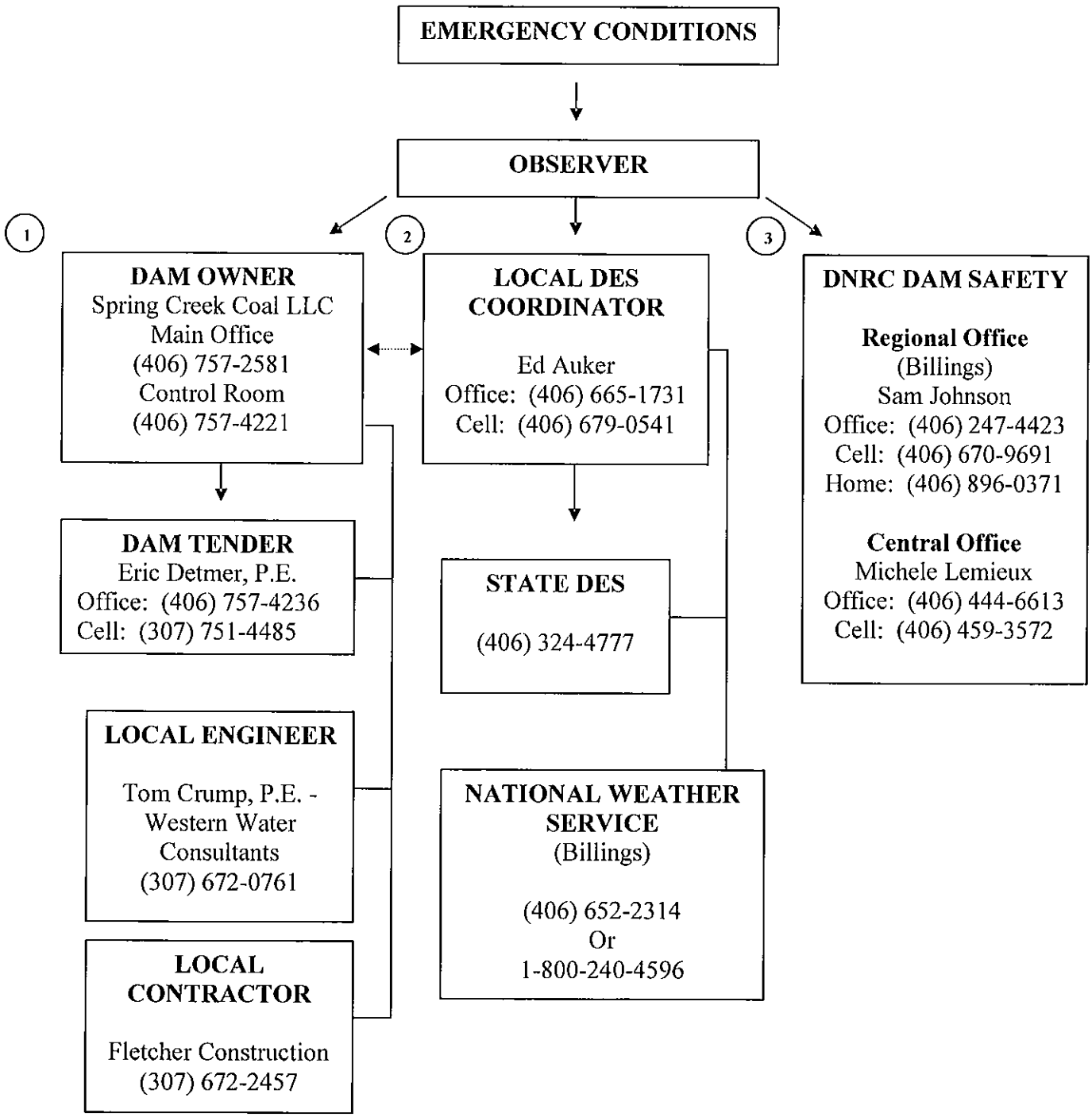
(1) Workers in the hazard area downstream from the dam must be evacuated according to the county warning plan, and initiated as shown in Figure 1 (next page); and

(2) Any steps that might save the dam or reduce damage to the dam or hazard area downstream should be taken. (Refer to the maps CARBONE FLOOD CONTROL RESERVOIR AS-BUILT DRAWINGS – SHEETS 1, 2, and 3 in Appendix B to determine the areas that are likely to be inundated if the dam fails).

As dam owner, it is your responsibility to:

1. Call the Sheriff's Dispatch Center (406) 665-9780 or 911 and Disaster and Emergency Services (406) 665-1731, if they have not already been notified. Be sure to say, 'This is an emergency'. They will call other authorities and the media and begin the warning plan.
2. Warn anyone in immediate danger to evacuate to safety (see Appendix C). This includes someone on the dam, workers below the dam, State Highway 314, railway and Tongue River Reservoir State Park as directed by the sheriff.
3. Contact the DES staff at lease once every hour. They may request your assistance in evacuation.
4. If all means of communication are lost:
    a. Try to find out why.
    b. Get someone else to try to reestablish communications. If these means fail, take care of immediate problems and send someone to get to another radio or telephone that works.

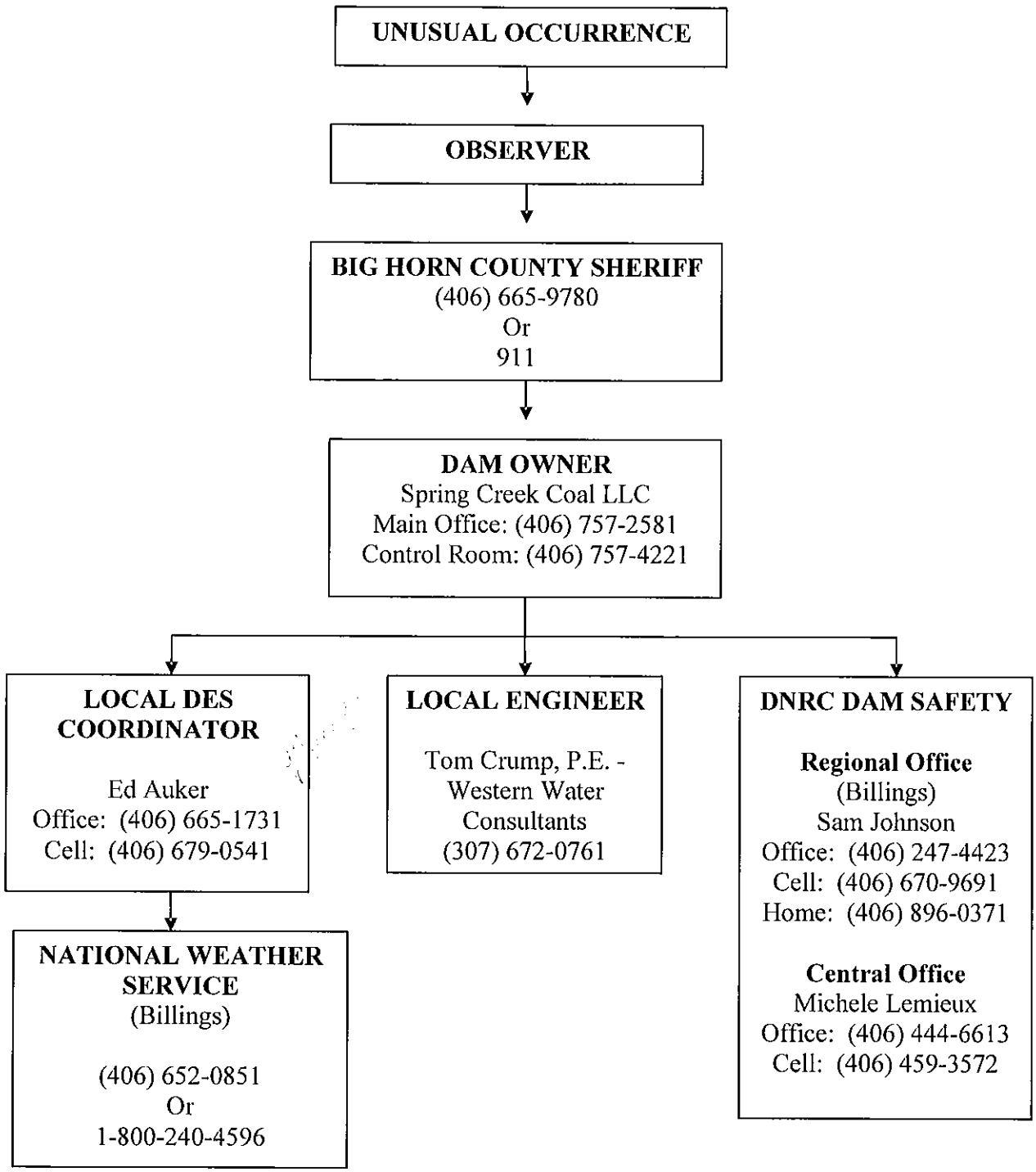
FIGURE 1
CARBONE DAM
ACTUAL OR IMMINENT FAILURE
"NOTIFICATION FLOW CHART"



B. Potentially Hazardous Situations

A potentially hazardous situation is an event or condition not normally encountered in the routine operation of the dam and reservoir. Among these unusual occurrences that may affect the dam are dam embankment problems (see section B.2), failure of the spillway or outlet works, heavy precipitation or rapid spring snow melt, landslides, earthquakes, erosion, theft, vandalism, acts of sabotage, and serious accidents. These occurrences may endanger the dam, the public, or the downstream valley and may necessitate a temporary or permanent revision of the dam's operating procedures. Help in these situations can be obtained by notifying those people shown in Figure 2.

FIGURE 2
CARBONE DAM
POTENTIALLY HAZARDOUS SITUATION
"NOTIFICATION FLOW CHART"



B. Potentially Hazardous Situations (Continued)

1. If the dam owner discovers an unusual condition of the dam embankment that could threaten the structure:
    a. Complete the Dam Incident Report Form in Appendix D.
    b. Have a qualified engineer inspect the dam as soon as possible to determine whether emergency action is required.
    c. Notify the county DES Coordinator at (406) 665-1731 of the potential problem.
    d. Contact the Dam Safety Program of the Department of Natural Resources and Conservation (DNRC).

2. Among the condition the dam owner should watch for are:
    a. Overtopping of the dam by flood waters.
    b. Loss of material from the dam crest due to storm wave erosion.
    c. Slides on either the upstream or downstream slop of the embankment as evidenced by:
        1. Sloughing
        2. Cracking
        3. Bulging
        4. Scarping
    d. Erosional flows through, beneath, or around the embankment as evidenced by:
        1. Excessive seepage
        2. Discoloration of the seepage
        3. Boils in the downstream side
        4. Sinkholes
        5. Changes in the flow from drains
    e. Failures of outlets of spillways due to clogging or erosion.
    f. Movement of the dam on its foundation as evidenced by:
        1. Misalignment
        2. Settlement
        3. Cracking

3. Before calling either an engineer or DNRC to report a problem, the dam owner shall use the form in Appendix D to ensure sufficient information is provided for the engineer to analyze the problems. After talking to the engineer, it may be helpful to document the condition of the dam by making a sketch on the form in Appendix D, showing the extent of the problem. Revise the sketch periodically if the problem develops further. Section III includes further guidelines for courses of action to mitigate the effects of many problems.

C. Posting of the Notification Flowchart and Distribution of the EAP

The Notification Flowchart is posted in the Control Room and a copy of the EAP is in the Control Room. A plan distribution list is found in Appendix E.

III. MITIGATION ACTIONS

Besides normal monitoring of the dam's condition, which is done at least monthly, the owner will provide continuous monitoring and inspection during and after extreme events such as storms and earthquakes. Information on the magnitude of an earthquake or storm can be obtained from the DNRC Dam Safety Program. Actions are suggested below to mitigate problems that may develop, but those actions should never be continued at the risk of injury or at the expense of lessening efforts related to evacuation. Monitoring should identify any of the following potential problems.

A. Potential Problems and Immediate Response Actions

1. OVERTOPPING BY FLOOD WATERS
   - a. Open outlets to its maximum safe capacity.
   - b. Place sandbags along the crest to increase freeboard and force more water through the spillway and outlet.
   - c. Provide erosion-resistant protection to the downstream slope by placing plastic sheets or other materials over eroding areas.
   - d. Divert flood waters around the reservoir basin, if possible.
   - e. Create additional spillway capacity by making a controlled breach in a low embankment or dike section where the foundation materials are erosion-resistant.

2. LOSS OF FREEBOARD OR DAM CROSS SECTION DUE TO STORM WAVE EROSION
   - a. Place additional riprap or sandbags in damaged areas to prevent further embankment erosion.
   - b. Lower the water level to an elevation below the damaged area.

3. SLIDES IN THE UPSTREAM OR DOWNSTREAM SLOPE OR THE EMBANKMENT
   - a. Lower the water level at a rate and to an elevation considered safe, given the slope condition. If the outlet is damaged or blocked, pumping, siphoning, or a controlled breach may be required.
   - b. Stabilize slides on the downstream slope by:
     1. Weighting the toe area with additional soil, rock, or gravel, and then
     2. Restoring lost freeboard by replacing sandbags at the crest.

4. EROSIONAL FLOWS THROUGH THE EMBANKMENT, FOUNDATION, OR ABUTMENTS
    a. Plug the flow with whatever material is available (hay bales, bentonite, or plastic sheeting if the entrance leak is in the reservoir basin)
    b. Lower the water level until the flow decreases to a non-erosive velocity or stops.
    c. Place a protective sand-and-gravel filter or boil ring over the exit area to hold materials in place.

5. FAILURE OR APPURTENANT STRUCTURES SUCH AS OUTLETS OR SPILLWAYS
    a. Implement temporary measures to protect the damaged structure, such as closing an outlet or protecting a damaged spillway with riprap.
    b. Lower the water level to a safe elevation. If the outlet is inoperable, pumping, siphoning, or a controlled breach may be required.

6. MASS MOVEMENT OR THE DAM ON ITS FOUNDATION (SPREADING OR MASS SLIDING FAILURE)
    a. Immediately lower the water level until excessive movement stops.

7. EXCESSIVE SEEPAGE AND HIGH LEVEL SATURATION OF THE EMBANKMENT
    a. Lower the water to a safe level.
    b. Continue frequent monitoring for signs of slides, cracking, or concentrated seepage.

8. SPILLWAY BACKCUTTING, THREATENING RESERVOIR EVACUATION
    a. Reduce the flow over the spillway by fully opening the main outlet
    b. Provide temporary protection at the point or erosion by placing sandbags, riprap materials, or plastic sheets weighted with sandbags.
    c. When the inflow subsides, lower the water to a safe level.

9. EXCESSIVE SETTLEMENT OF THE EMBANKMENT
   a. Lower the water level by releasing it through the outlet pumping, siphoning, or a controlled breach.
   b. If necessary, restore freeboard, preferably by placing sandbags.

B. Emergency Supplies and Resources

Clayey solids can be found downstream (SE) of the dam. Contact operations for the most up to date location of available materials.

C. Local Contractors and Engineers

Local Contractors:
Fletcher Construction: (307) 672-2457

Local Engineers:
Western Water Consultants
Tom Crump, P.E.: (307) 672-0761

APPENDICES

APPENDIX A

Technical Data for Carbone Dam

Max Reservoir Capacity to the Crest of the Dam: ..... 1,050 acre feet

Normal Reservoir Capacity Measured to the Emergency Spillway Crest: ..... 327 acre feet

Normal Water Depth Measured from the Upstream Streambed to the Crest of the Emergency Spillway: ..... 20 feet

Dam Height Measured from Upstream Streambed to Crest of Dam: ..... 30 feet

Dam Crest Width: ..... 20 feet

Length of Dam Crest: ..... 2,400 feet

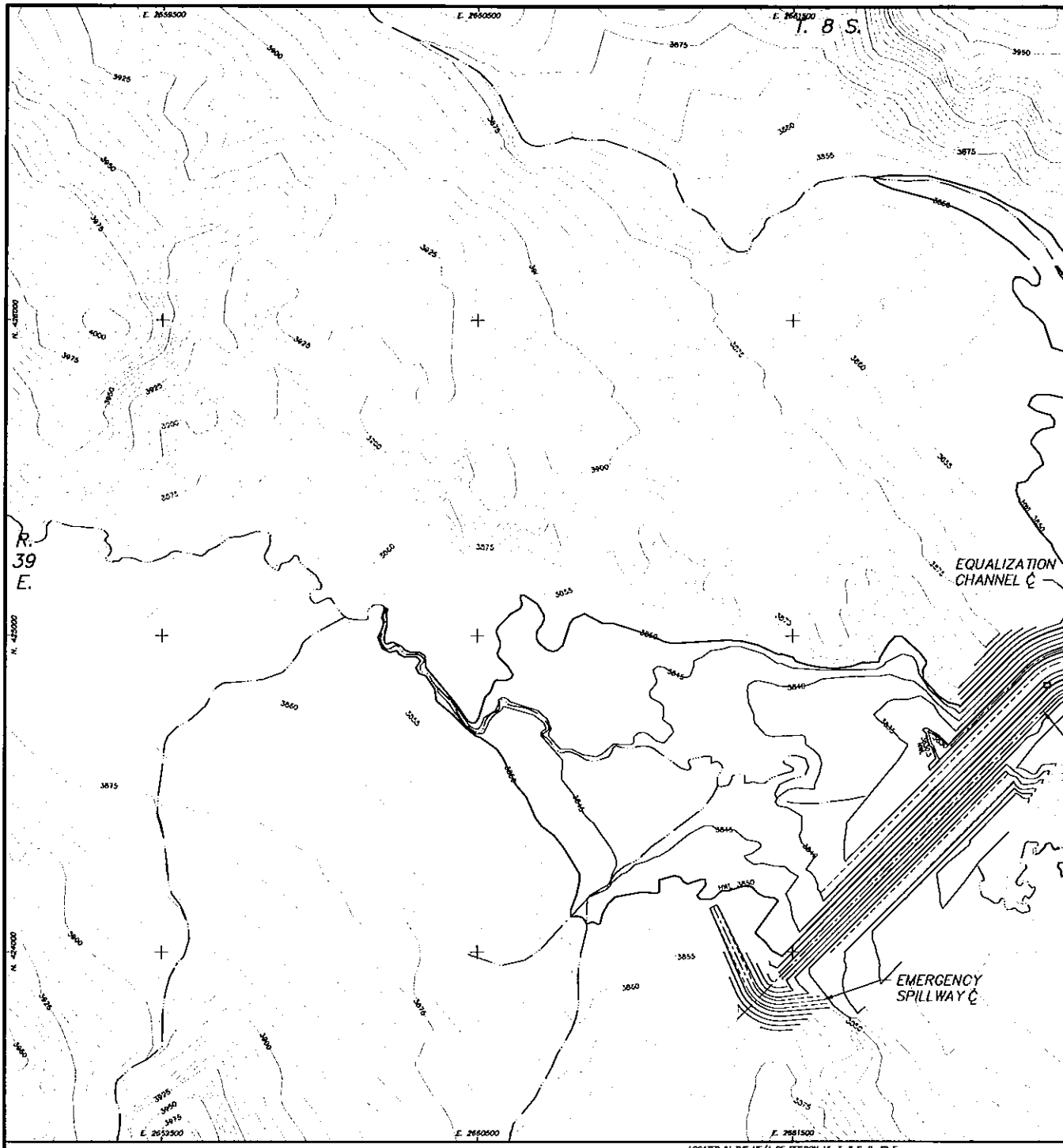
Outlet Capacity: ..... 31.85 cubic feet per second

Spillway Capacity: ..... 377.6 cubic feet per second

Date Constructed: 2002

Slope of Upstream Face of Dam (Horizontal to Vertical): 3:1

Slope of Downstream Face of Dam (Horizontal to Vertical): 2.5:1



LOCATED IN THE NE/4 OF SECTION 13, T. 8 S. R. 39 E.

PLAN VIEW

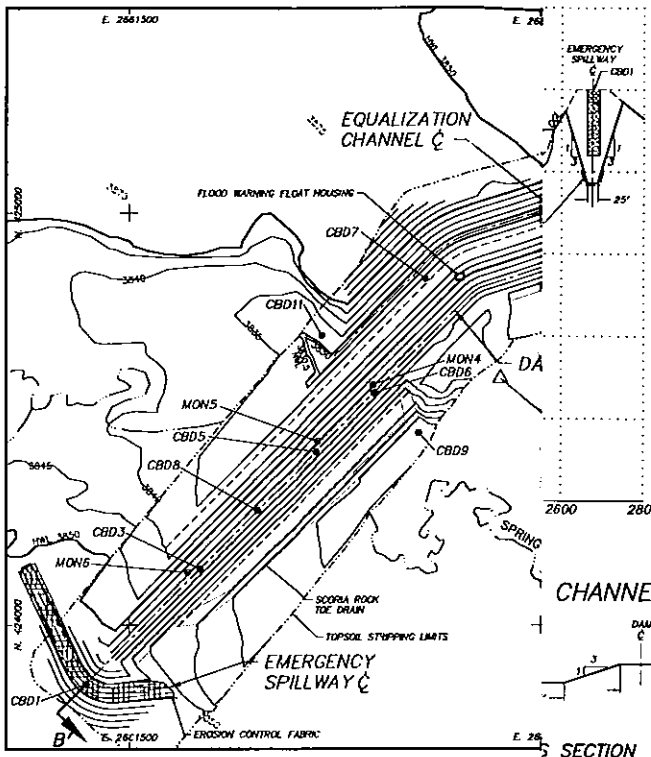
SCALE: 1" = 200'
C.I. = 5'

AREA CAPACITY TABLE

ELEVATION (ft)	AREA (ac)	AVG. AREA (ac)	CAPACITY (ac-ft)	
			INCR.	ACCUM.
3830.0	0.45	0.52	0.26	0.00
3830.5	0.59	1.55	6.98	0.26
3835.0	2.51	6.61	33.05	7.24
3840.0	10.70	19.22	96.10	40.29
3845.0	27.74	38.11	190.55	136.39
3850.0	48.48			326.94

CERTIF

I, Thomas E.
was prepared by m
for whose work I s
to the best of my



NOTE: CBD1 THROUGH CBD28 ARE BOREHOLES USED DURING GEOTECHNICAL AND BORROW INVESTIGATIONS.

NOTE: MON1 THROUGH MON6 ARE SETTLEMENT MONUMENTS.

EMERGENCY SPILLWAY HYDRAULICS

CONTROL SECTION

$Q = CLH^{3/2}$

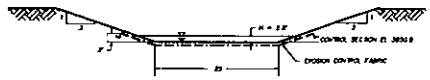
$Q_{100\text{-}yr}$ = 377.60 cfs
C = 3.22
L = 25 ft
H = 2.8 ft

TRANSPORT SECTION

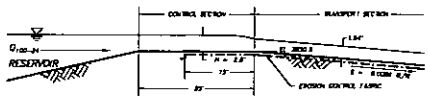
$Q = \frac{1.49}{n} AR^{2/3} S^{1/2}$

Q = 377.60 cfs
n = 0.030
S = 0.0086 ft/ft
Z = 3H:1V
b = 25 ft
A = 59.92 ft
WP = 37.29 ft
R = 1.61 ft
V = 6.30 fps
Yn = 1.94 ft

NOTE: EMBANKMENT AND EMERGENCY SPILLWAY SLOPES ARE PROTECTED FROM EROSION BY PLANTING WITH GRASS MIXTURE. (SOME SEEDING MAY BE DELAYED UNTIL FALL 2002.) EROSION CONTROL FABRIC WAS INSTALLED IN THE SPILLWAY AS SHOWN.

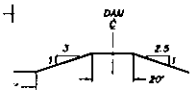


EMERGENCY SPILLWAY CROSS SECTION
NOT TO SCALE



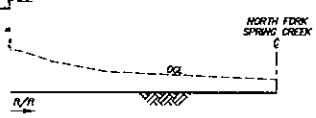
EMERGENCY SPILLWAY PROFILE
NOT TO SCALE

CHANNEL

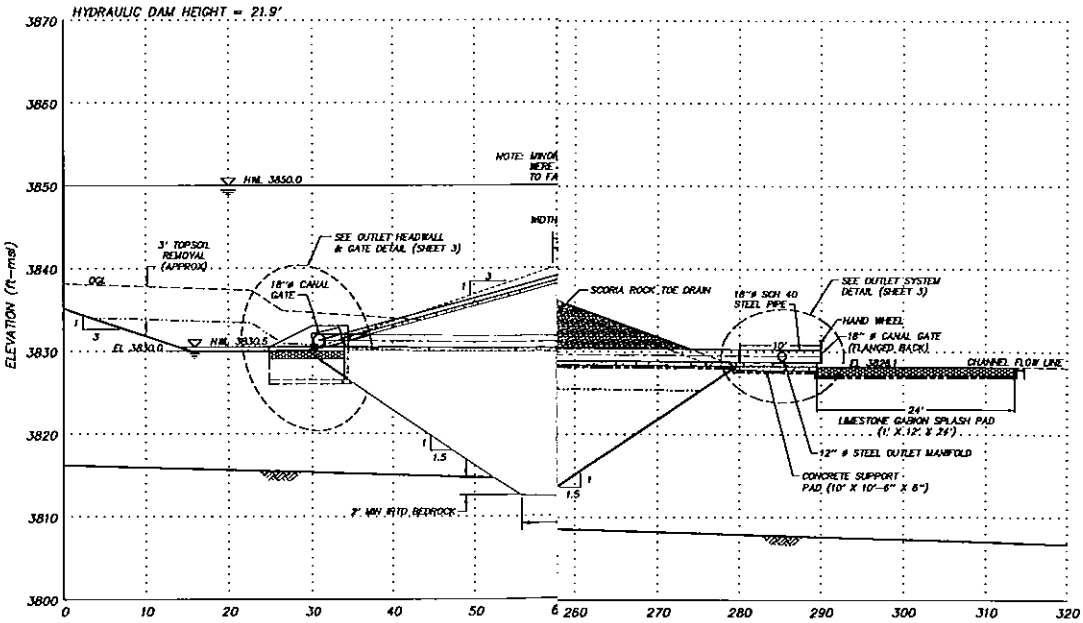


S SECTION

PLAN
SCALE: 1" =
C.I. =

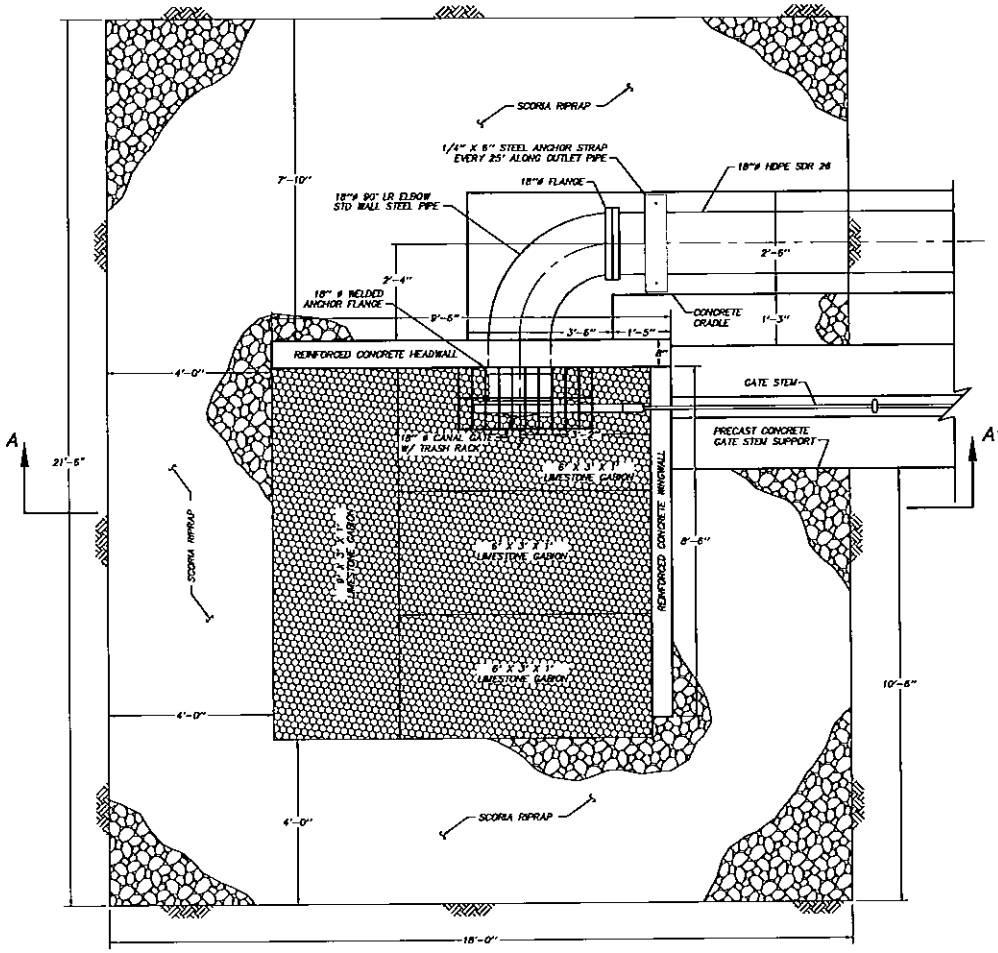


'LE
:CALE

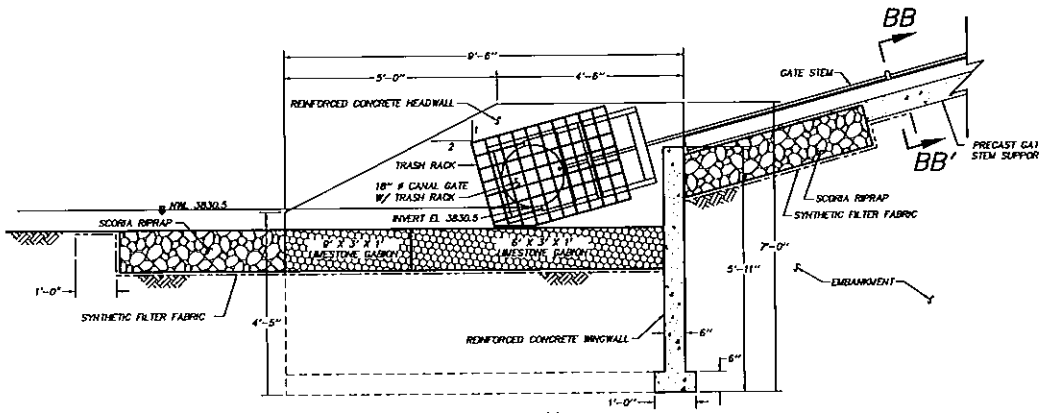


SHEET 2

REVISIONS	SPRING CREEK COAL COMPANY
	CARBONE FLOOD CONTROL RESERVOIR AS-BUILT DRAWINGS
	DESIGN: TEC DRAWN: MBM DATE: 2-28-03
	SCALE: AS SHOWN FILE NUMBER: SC_CBR02.AB



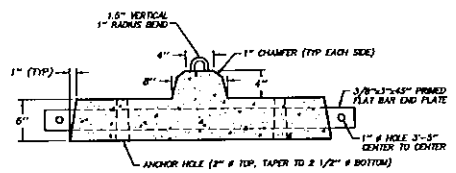
PLAN VIEW



SECTION A–A'

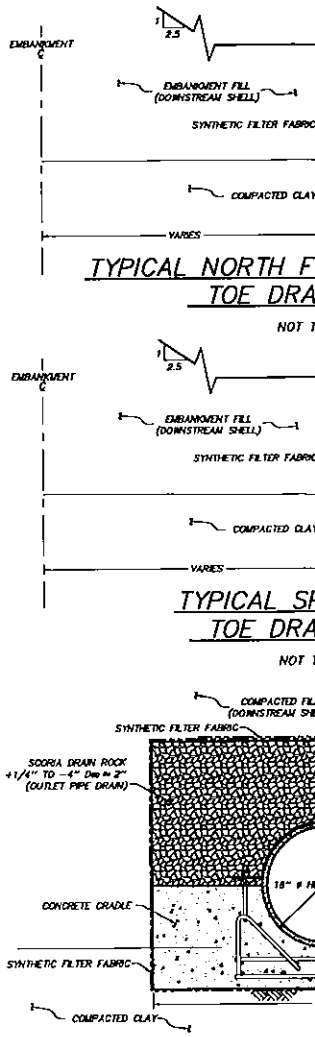
OUTLET HEADWALL AND GATE DETAILS

SCALE: 1" = 2'



PRECAST CONCRETE GATE STEM SUPPORT TYPICAL CROSS SECTION BB–BB'

NOT TO SCALE



TYPICAL NORTH F
TOE DRA

NOT T

TYPICAL SI
TOE DRA

NOT T

OUTLET PIPE AND CO
TYPICAL CROSS

SCALE

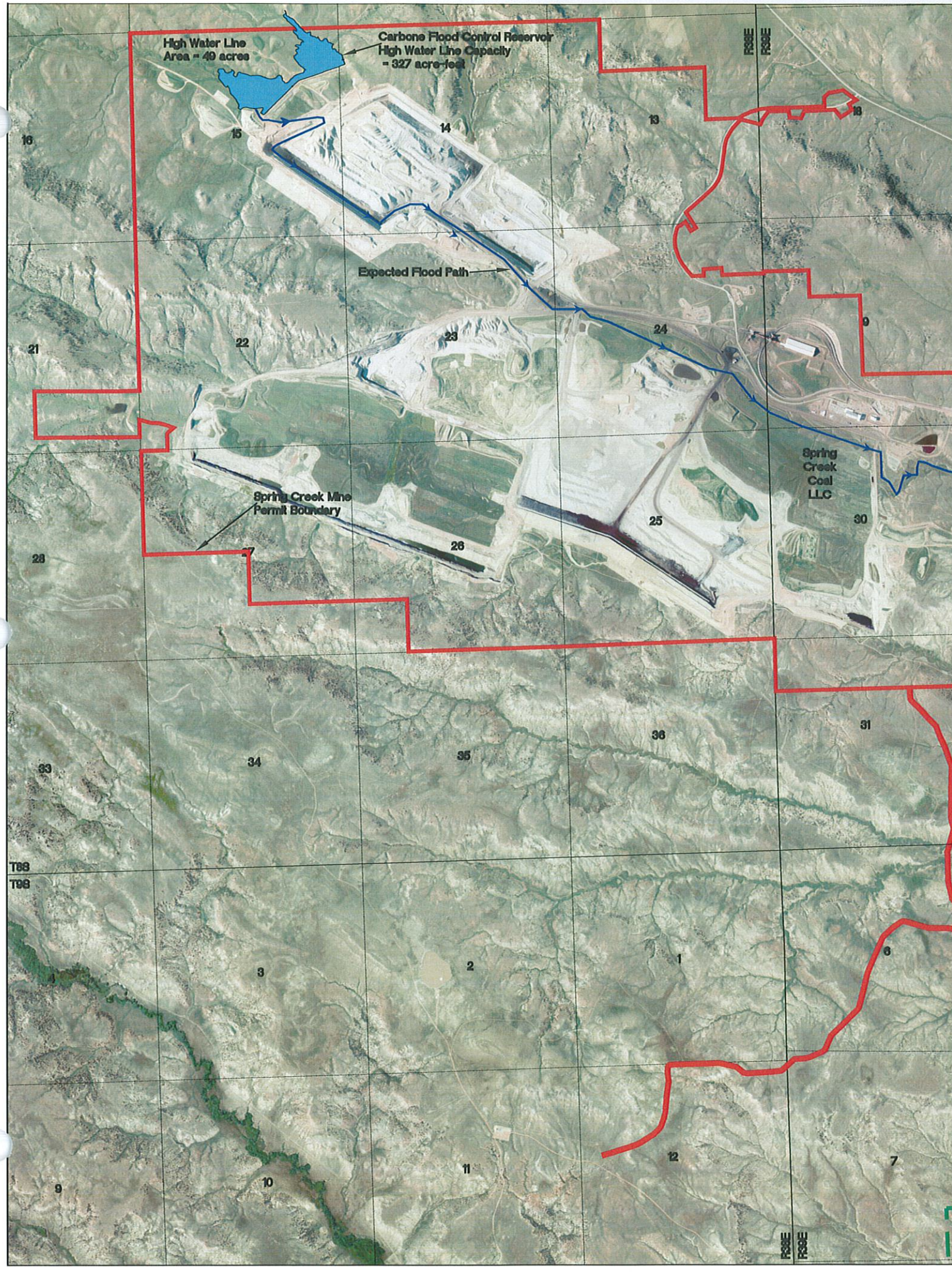
DRAINAGE D

CERT

I, Thom
was prepared
for whose wor
to the best o

APPENDIX B

Inundation and Evacuation Maps


High Water Line
Area = 49 acres
Carbone Flood Control Reservoir
High Water Line Capacity
= 327 acre-feet
Expected Flood Path
Spring Creek Mine
Permit Boundary
Spring
Creek
Coal
LLC
R3E
R3E
R3E
R3E
T8S
T9S
16
15
14
13
18
21
22
23
24
9
25
30
28
27
26
31
36
35
34
33
1
2
3
6
12
11
10
9
7

APPENDIX C

TELEPHONE DIRECTORY

A. Priority One

1. SHERIFF Big Horn County ..... (406) 665-9780 or 911
2. DISASTER AND EMERGENCY SERVICES Big Horn County

   Ed Auker ..... Office: (406) 665-1731

   .....Cell: (406) 679-0541

   DISASTER AND EMERGENCY SERVICES State Office, Helena

   .....(406) 324-4777
3. EVACUEES (in upstream-to-downstream sequence)

   * This list is not intended to replace local evacuation plans.

   1) *Spring Creek Coal LLC (Control Room) .....(406) 757-4221

   2) Decker Coal Company (Main Line) .....(406) 757-2561

   3) Tongue River Reservoir State Park

      Bob Peterson, Park Manager..... Office: (406) 757-2298

      .....Cell: (406) 853-0128

B. Priority Two

4. LOCAL ENGINEER

   Tom Crump, Western Water Consultants, Inc.....(307) 672-0761
5. MONTANA DEPT. OF NATURAL RESOURCES AND CONSERVATION

   Sam Johnson, Regional Engineer (Billings) ..... Office: (406) 247-4423

   .....Cell: (406) 670-9691

   .....Home: (406) 896-0371

   Michele Lemieux, Dam Safety Program Civil Engineer (Helena)

   ..... Office: (406) 444-6613

   .....Cell: (406) 459-3572

   Laurence Siroky, Water Operations Bureau Chief (Helena)

   ..... Office: (406) 444-6816

   .....Cell: (406) 431-7475

TELEPHONE DIRECTORY

6. NATIONAL WEATHER SERVICE

   Billings..... (406) 652-0851 or 1-800-240-4596

7. SPRING CREEK MINE

   Bruce Jones, Mine Manager ..... Office: (406) 757-4233

   .....Cell: (307) 751-7088

APPENDIX D

DAM INCIDENT REPORT FORM

DATE: TIME:

NAME OF DAM: Carbone Flood Control Reservoir

STREAM NAME: North Fork of Spring Creek/Spring Creek

LOCATION:

COUNTY: Big Horn

OBSERVER:

OBSERVER TELEPHONE:

NATURE OF PROBLEM:

LOCATION OF PROBLEM AREA (Looking Downstream):

EXTENT OF PROBLEM AREA:

FLOW QUANTITY AND COLOR:

WATER LEVEL IN RESERVOIR:

IS SITUATION WORSENING?

EMERGENCY STATUS:

CURRENT WEATHER CONDITIONS:

ADDITIONAL COMMENTS:

APPENDIX E

Emergency Action Plan Distribution List

PLAN HOLDER	NUMBER OF COPIES
Dam Owner (Spring Creek Coal LLC)	2
Dam Tender (Eric Detmer)	1
Big Horn County Sheriff's Office	1
Local DES Coordinator (Ed Auker)	1
DNRC Dam Safety Program (Michele Lemieux)	1
DNRC Billings Regional Office (Sam Johnson)	1
Decker Coal Company (Greg Passini)	1
Tongue River Reservoir State Park (Bob Peterson)	1
MT Disaster and Emergency Services (Dave Maser)	1
National Weather Service (Gina Loss)	1